

Title (en)  
TRANS-REPLICATING RNA

Title (de)  
TRANS-REPLIZIERENDE RNA

Title (fr)  
ARN À RÉPLICATION TRANS

Publication  
**EP 3433368 A1 20190130 (EN)**

Application  
**EP 17710268 A 20170313**

Priority

- EP 2016056160 W 20160321
- EP 2017055813 W 20170313

Abstract (en)

[origin: WO2017162265A1] The present invention generally relates to systems and methods suitable for high-level protein production. While one or more elements of the present invention are derived from an alphavirus, the present invention does not require propagation of virus particles. In particular, a system comprising two separate RNA molecules is foreseen, each comprising a nucleotide sequence derived from an alphavirus: one RNA molecule comprises a RNA construct for expressing alphavirus replicase, and one RNA molecule comprises a RNA replicon that can be replicated by the replicase in trans. The RNA construct for expressing alphavirus replicase comprises a 5'-cap. It was surprisingly found that the 5'-cap is suitable for efficiently driving expression of a transgene from the replicon in trans. The system of the present invention enables expression of a protein of interest in a cell or organism, but is not associated with undesired virus-particle formation. Therefore, the present invention is suitable for efficiently and safely producing a protein of interest, e.g. a therapeutic protein or an antigenic protein, such as a vaccine, in a target organism. Respective methods of protein production in vitro and in vivo as well as medical uses are provided herein. The present invention also provides DNA encoding the RNA molecules of the invention, and cells comprising the RNA molecules of the invention.

IPC 8 full level  
**C12N 15/86** (2006.01); **A61K 48/00** (2006.01); **C12N 5/10** (2006.01); **C12N 15/40** (2006.01)

CPC (source: CN EP IL KR RU US)  
**A61P 31/16** (2018.01 - EP IL RU); **C07K 14/005** (2013.01 - CN IL); **C12N 5/10** (2013.01 - IL RU); **C12N 9/127** (2013.01 - CN IL); **C12N 15/00** (2013.01 - IL US); **C12N 15/1131** (2013.01 - IL US); **C12N 15/64** (2013.01 - IL US); **C12N 15/79** (2013.01 - IL US); **C12N 15/86** (2013.01 - CN EP IL KR RU US); **C12Y 207/07048** (2013.01 - CN IL); **C12N 2770/36122** (2013.01 - CN IL); **C12N 2770/36141** (2013.01 - IL US); **C12N 2770/36143** (2013.01 - CN EP IL KR US)

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WO2024133550A1

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)  
BA ME

DOCDB simple family (publication)  
**WO 2017162265 A1 20170928**; AU 2017236240 A1 20180920; AU 2017236240 B2 20221117; BR 112018068391 A2 20190115; CA 3017285 A1 20170928; CN 109328233 A 20190212; CN 109328233 B 20221011; CN 115386596 A 20221125; CY 1124689 T1 20220722; DK 3433368 T3 20211115; EP 3433368 A1 20190130; EP 3433368 B1 20211006; EP 3964584 A1 20220309; ES 2896927 T3 20220228; HR P20211715 T1 20220218; HU E058889 T2 20220928; IL 261327 A 20181031; IL 261327 B1 20240401; IL 261327 B2 20240801; JP 2019509048 A 20190404; JP 2022020634 A 20220201; JP 7105193 B2 20220722; JP 7421256 B2 20240124; KR 102441725 B1 20220908; KR 20180127360 A 20181128; LT 3433368 T 20211125; MA 44479 A 20210421; MA 44479 B1 20211130; MD 3433368 T2 20211231; MX 2018011384 A 20190213; PL 3433368 T3 20211227; PT 3433368 T 20211115; RS 62543 B1 20211231; RU 2018131783 A 20200422; RU 2018131783 A3 20200714; RU 2752580 C2 20210729; SG 11201807378S A 20181030; SI 3433368 T1 20220131; US 2020299724 A1 20200924; WO 2017162461 A1 20170928; ZA 201805520 B 20191127; ZA 201905396 B 20210331

DOCDB simple family (application)  
**EP 2016056160 W 20160321**; AU 2017236240 A 20170313; BR 112018068391 A 20170313; CA 3017285 A 20170313; CN 201780018575 A 20170313; CN 20221115420 A 20170313; CY 211100949 T 20211103; DK 17710268 T 20170313; EP 17710268 A 20170313; EP 2017055813 W 20170313; EP 21200788 A 20170313; ES 17710268 T 20170313; HR P20211715 T 20170313; HU E17710268 A 20170313; IL 26132718 A 20180822; JP 2018549306 A 20170313; JP 2021160491 A 20210930; KR 20187027526 A 20170313; LT EP2017055813 T 20170313; MA 44479 A 20170313; MD E20190126 T 20170313; MX 2018011384 A 20170313; PL 17710268 T 20170313; PT 17710268 T 20170313; RS P20211377 A 20170313; RU 2018131783 A 20170313; SG 11201807378S A 20170313; SI 201730973 T 20170313; US 201716086127 A 20170313; ZA 201805520 A 20180817; ZA 201905396 A 20190815